

In-flight Calibration of the Airborne Visible /Infrared
imaging Spectrometer (AVIRIS) Using the "La Crau" site,
France 1991

Robert Green, James Cone], Gregg Vane, Jack Margolis

Jet Propulsion Laboratory
4800 Oak Grove Dr
Pasadena, CA 91109

ABSTRACT

A valid spectral and radiometric calibration of radiance-measuring instruments is required for physically based analysis of the measured data and for quantitative comparison of data acquired from different sites, times and instrument-s. To calibrate the in-flight characteristics of AVIRIS, an calibration experiment was held at the La Crau site in southern France. Ground based surface and atmosphere c measurements with calibrated field instruments were acquired concurrently with five AVIRIS overflights. These ground based measurements have been reduced to physical parameters. With these parameters the MODTRAN radiative transfer code has been constrained to predict the upwelling radiance at the AVIRIS sensor during the calibration overflights. Analysis of the radiative transfer code predicted radiance in conjunction with the AVIRIS measured radiance has allowed in-flight characterization of AVIRIS for the summer of 1991.

This analysis shows the in-flight radiometric calibration of the AVIRIS spectral range from 400 to 1850 nm to be nominal. However, a decrease in sensor radiometric response is shown for the 1850 to 2450 nm region. This decrease in sensor response was expected based on approximate data provided by the AVIRIS on-board-reference source. Data from the La Crau in-flight calibration experiment, have been used to reestablish the radiometric calibration of the 1850 to 2450 nm spectral region. Additional analysis with the radiative transfer predicted and AVIRIS measured radiance has shown the spectral calibration across the entire range to have remained nominal.